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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jifeng Li

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EXAMINER

NG, FAN

ART UNIT

PAPER NUMBER

4145

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/565,841	<b>Applicant(s)</b> LI, JIFENG	
	<b>Examiner</b> FAN NG	<b>Art Unit</b> 4145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/12/2006, 01/26/2006</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 101***

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The claimed invention is directed to non-statutory subject matter.

Claim 10 is rejected under USC 101, because it is not tied to one of the statutory category.

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show label in fig. 3-5 and fig. 7, as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must

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be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2.

### ***Specification***

3. The disclosure is objected to because of the following informalities: Summary section is missing from the specification. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-6, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant (2003/0067990) in view of McGowan (2001/0000456).

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6. As per claim 1, **Bryant teaches** A peak power suppressing apparatus comprising: a generation section that generates (**Fig. 1, #105: modulation circuitry**) a multi-carrier signal in which data is superimposed on a plurality of carriers (**[0003]: plants information into the variation. This regard, a modulated carrier “carries” the information**); a conversion section that converts power of the generated multi-carrier signal with a non-linear function (**[0019]: “the signal ... characterized by known nonlinear function... PAR (peak to average power ratio) is limited”**). The signal is multi-carrier signal as describe above, and the power of signal is compression or limit (converted). Also shown in Fig. 4 a-c)

7. ... and a transmission section that transmits the multi-carrier signal after the power conversion (**Fig. 1, after power conversion #110, signal is transmitted at #120, #116**).

8. **Bryant doesn't teach** whereby an input value is mapped in a direction an absolute value becomes larger near the origin and the map of the input value gradually approaches a predetermined value as said map becomes distant from the origin;

9. **McGowan teaches** ... whereby an input value is mapped in a direction an absolute value (**Fig. 6, multi-carrier input go into #602, which is a absolute value process, see Fig. 7, #704**) becomes larger near the origin and the map of the input value gradually approaches a predetermined value as said map becomes distant from the origin (**Fig. 6, after #602 signal goes into power conversion unit #606, and**

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**[0034-35] if ratio  $u \leq 1$  (means input power is small so near the origin) then the mapping function  $f$  is 1 (larger value). If  $u > 1$  (means input power is big so far from the origin), then the mapping function  $f$  is  $1/(u)^{1/2}$ . Know  $1/(u)^{1/2}$  never larger than 1, also in [0035]: “ $f$  is set to a value sufficient to lower the power corresponding to the baseband signals, ...”, which further enforce that in the case of  $u > 1$ ,  $f$  approaches to a predetermined value.)**

Thus it would have been obvious to one of ordinary in the art at the time of the invention was made to implement the teachings of McGowan's idea into Bryant, since Bryant suggests arctangent way to convert the signal power and McGowan suggests signal mapping to regulate the signal within limit, the beneficial use of signal mapping is to regulate the signal within the limit, so that signal with large power wouldn't saturated the amplifier, they are in the analogues art of PAR control.

10. As per claim 2, **Bryant and McGowan teaches** the peak power suppressing apparatus according to claim 1, **Bryant teaches** wherein the conversion section (**Fig. 1, #110**) converts the power of the multi-carrier signal (**Fig. 1, #105**) with the non-linear function (**Fig. 4 a-c**) using an arctangent (**[0030]**).

11. As per claim 3, **Bryant and McGowan teaches** The peak power suppressing apparatus according to claim 2, **Bryant teaches** wherein the conversion section converts power  $x$  of the multi-carrier signal to power  $y$  by equation:

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12.  $y = a \cdot \tan^{-1}(b \cdot x)$  where a and b are predetermined coefficients ([0030]: here a is xh and b is 1/xh. They are pre-determined see [0030]: “define a parameter xh as the value of x for which ....”).

13. As per claim 4, **Bryant and McGowan teaches** the peak-power suppressing apparatus according to claim 2, **Bryant teaches** wherein the conversion section comprises: a coefficient storage section that stores a coefficient of the non-linear function (it is inherent, that coefficient must store to somewhere before it can be used, and in [0030] compression function y used coefficient xh, thus it must stored); and an arctangent calculation section that performs an arctangent calculation with the power of the multi-carrier signal using the stored coefficient ([0034] : arctangent calculation y is performed. And multi-carrier signal is come from Fig. 1, #105).

14. As per claim 5, **Bryant and McGowan teaches** the peak power suppressing apparatus according to claim 2, **Bryant teaches** wherein the conversion section comprises: a parameter acquisition section that acquires a parameter providing an indicator of communication environment ([0029]: x is the parameter that also indicate the amplitude of a signal being compressed, which represents the environment because the main idea is to compress the amplitude); a coefficient determination section that determines the coefficient of the non-linear function based on the acquired parameter (Fig. 2 (non-linear function) and [0030]: “xh as the value of x for which

**the slope of the compression function...”, so  $x_h$  is the coefficient which based on Fig.2 and  $x$ ); and an arctangent calculation section that performs an arctangent calculation with the power of the multi-carrier signal using the determined coefficient ([0030]: compression function  $y$ ).**

15. As per claim 6, **Bryant and McGowan teaches** the peak power suppressing apparatus according to claim 5, **Bryant teaches** wherein the parameter acquisition section acquires at least one parameter from: power amplifier characteristics of the peak power suppressing apparatus ([0034]: “select parameter  $x_h$ , a desired level of PAR reduction can be achieved...”, the PAR is peak power to average ratio, which is the requirement of power amplifier); and the number of multiplexed codes, modulation level, or coding rate of the multi-carrier signal.

16. As per claim 8, **Bryant and McGowan teach** ...the peak power suppressing apparatus of claim 1.

17. **Bryant doesn't teach** a base station apparatus comprising ...  
**McGowan teaches** a base station apparatus comprising ([0003]) ...

18. Thus it would have been obvious to one of ordinary in the art at the time of the invention was made to implement the teachings of McGowan's idea into Bryant, since Bryant suggests arctangent way to convert the signal power and McGowan suggests signal mapping to regulate the signal within limit, the beneficial use of signal mapping is



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to regulate the signal within the limit, so that signal with large power wouldn't saturated the amplifier, they are in the analogues art of PAR control.

19. As per claim 9, **Bryant and McGowan teach** ...comprising the peak power suppressing apparatus of claim 1.

**Bryant doesn't teach** a mobile station apparatus...

20. **McGowan teaches** a mobile station apparatus **([0003])**...

21. Thus it would have been obvious to one of ordinary in the art at the time of the invention was made to implement the teachings of McGowan's idea into Bryant, since Bryant suggests arctangent way to convert the signal power and McGowan suggests signal mapping to regulate the signal within limit, the beneficial use of signal mapping is to regulate the signal within the limit, so that signal with large power wouldn't saturated the amplifier, they are in the analogues art of PAR control.

22. As per claim 10, **Bryant teaches** a peak power suppression method comprising the steps of: generating **(Fig. 1, #105: modulation circuitry)** a multi-carrier signal in which data is superimposed on a plurality of carriers **([0003]: plants information into the variation. This regard, a modulated carrier "carries" the information);** converting power of the generated multi-carrier signal with a non-linear function **([0019]: "the signal ... characterized by known nonlinear function... PAR (peak to average power ratio) is limited"**. The signal is multi-carrier signal as describe above, and the power of signal is compression or limit (converted). Also shown in Fig. 4 a-c)

23. ...and transmitting the multi-carrier signal after the power conversion (**Fig. 1, after power conversion #110, signal is transmitted at #120, #116).**

**24. Bryant doesn't teach** whereby an input value is mapped in a direction an absolute value becomes larger near the origin and the map of the input value gradually approaches a predetermined value as said map becomes distant from the origin;

**25. McGowan teaches** ...whereby an input value is mapped in a direction an absolute value (**Fig. 6, multi-carrier input go into #602, which is a absolute value process, see Fig. 7, #704**) becomes larger near the origin and the map of the input value gradually approaches a predetermined value as said map becomes distant from the origin (**Fig. 6, after #602 signal goes into power conversion unit #606, and [0034-35] if ratio  $u \leq 1$  (means input power is small so near the origin) then the mapping function  $f$  is 1 (larger value). If  $u > 1$  (means input power is big so far from the origin), then the mapping function  $f$  is  $1/(u)^{(1/2)}$ . Know  $1/(u)^{(1/2)}$  never larger than 1, also in [0035]: “ $f$  is set to a value sufficient to lower the power corresponding to the baseband signals, ...”, which further enforce that in the case of  $u > 1$ ,  $f$  approaches to a predetermined value.);**

26. Thus it would have been obvious to one of ordinary in the art at the time of the invention was made to implement the teachings of McGowan's idea into Bryant, since Bryant suggests arctangent way to convert the signal power and McGowan suggests

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signal mapping to regulate the signal within limit, the beneficial use of signal mapping is to regulate the signal within the limit, so that signal with large power wouldn't saturated the amplifier, they are in the analogues art of PAR control.

27. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bryant (2003/0067990) in view of McGowan (2001/0000456) and further in view of Attallah (2002/0168013).

28. As per claim 7, **Bryant and McGowan teach** the peak power suppressing apparatus according to claim 1,

29. **Bryant teaches** wherein the conversion section converts the power of the multi-carrier signal (**Fig. 1, multi-carrier signal (#105) is converted by #110**) ...

30. **Bryant and McGowan do not teach** ...after approximating the non-linear function with a linear function.

31. **Attallah teaches** ...after approximating the non-linear function with a linear function (**[0047]**).

32. Thus it would have been obvious to one of ordinary in the art at the time of the invention was made to implement the teachings of Attallah's idea into Bryant, since Bryant suggests arctangent way to convert the signal power and Attallah suggests approximate this non-linear function using linear function, the beneficial use of this approximation is the simplicity, since it is very hard to calculate a non-linear function, they are in the analogues art of PAR control.

### ***Conclusion***

- a. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FAN NG whose telephone number is (571)270-3690. The examiner can normally be reached on Monday-Friday; 7:30am-5:30pm.
- b. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pankaj Kumar can be reached on (571)272-3011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.
- c. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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33.

34.

35. /F. N./

36. Examiner, Art Unit 4145

/Pankaj Kumar/

Supervisory Patent Examiner, Art Unit 4145